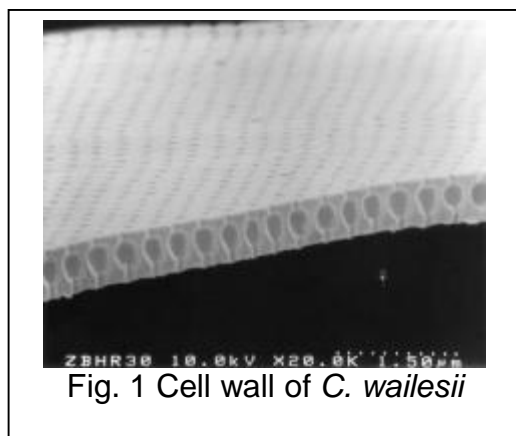


Light-emitting biological photonic crystals

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Photonic crystal structures in nature are extremely diverse with respect to material composition, structural complexity and function. Here we present one of the few examples of photonic crystals in plants that offers the possibility of tailoring the material composite properties. The silica cell wall of centric diatoms (genus *Coscinodiscus*) can



be regarded as photonic crystal slab waveguide with hexagonal and square patterns (Fig. 1, Ref. [1]). The biological process of silica deposition allows the incorporation of certain dyes into the biocomposite structure by *in-vivo* techniques. Experiments on the incorporation of laser dyes and their emission properties in the slab waveguide structure are presented.

[1] T. Fuhrmann, S. Landwehr, M. El Rharbi-Kucki, M. Sumper, *Appl. Phys. B*, **78**, 257 (2004).